AMRL-TR-65-118

SELF-CONFRONTATION FOR COMPLEX SKILL TRAINING

REVIEW AND ANALYSIS

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SEPTEMBER 1965

AEROSPACE MEDICAL RESEARCH LABORATORIES
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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FOREWORD

This study was initiated by the Training Research Division of the Behavioral Sciences Laboratory, Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio. The study was conducted under Project 1710, "Training, Personnel, and Psychological Stress Aspects of Bioastronautics", Task 171008, "Training for Culture-Contact and Interaction Skills in Counterinsurgency." Dr. Gordon A. Eckstrand was the Project Scientist. Dr. Donald B. Haines (deceased) was the Task Scientist. The literature review and analysis was performed in-service by 1/Lt Herbert T. Eachus, Research Psychologist. This review began in April 1964 and was completed in December 1964.

The author wishes to thank Mr. Melvin T. Snyder for his patient assistance in the preparation of the manuscript.

This technical report had been reviewed and is approved.

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ABSTRACT

A review of the literature on self-confrontation and related phenomena was conducted to investigate the feasibility of their use as training techniques. The phenomenon of self-confrontation is the feedback of an individual's performance in a given situation through the use of videotape or sound motion picture film. This technique provides complete feedback of information and generates a situation in which subjects are quite amenable to modifications of their behavior, both verbal and nonverbal, with respect to given standards. The body of technical literature dealing with self-confrontation is small but complete enough to provide a basis for discussion of the phenomenon as a training technique. The analysis of the literature resulted in the recommendation for a research program to explore self-confrontation as a training technique for complex human skills.

TABLE OF CONTENTS

SECTION I

INTRODUCTION

Self-confrontation is a phenomenon that provides a unique behavioral and psychological environment for certain types of training. Self-confrontation involves the presentation to an individual of a record of his performance in a given situation. For example, a novice golfer may benefit from seeing a film or videotape of himself swinging a club. An instructor can then make detailed corrections of the performance. Self-confrontation is like any feedback loop in a general sense. There is a distinction between feedback and self-confrontation; self-confrontation is limited to those situations in which a complete visual and auditory record is used as feedback, and is therefore a special case of feedback. A description of feedback or "knowledge of results" in human learning will make this distinction clear.

The notion of feedback has usually involved the implicit connotation of some type of primary or secondary reinforcement for given behaviors in research on human learning. Lumsdaine (ref 1) has recently presented an effective summary of the findings of experiments dealing with feedback. Much research on the learning of human and infrahuman species has dealt with manipulation of the parameters of reinforcement, but there has been very little attention devoted to analyzing the effects of reinforcement in practical instruction or training. Travers (ref 2, pp 106-117) has described the need for an inventory of reinforcers for use in human learning. Ex-parameters have assumed that knowledge of results or knowledge of correct response and similar stimuli act as a reinforcer. No clear analysis has been presented of how various means for presenting this reinforcement affects performance; further, no relationships have been established between kinds of tasks being taught and the nature of the reinforcing event.

The procedure of providing response error information to subjects has been analysed by Michael and Maccoby (ref 3) to have the effect of an additional implicit-practice trial. That is, when an individual is told by some means that the behavior which he has just completed resulted in success or failure, his performance improves in about the same manner as when additional trials occur. This effect is improved in the case of verbal behavior when the stimulus used to set the occasion for the behavior to be learned is presented with the correct response (Hirsch, ref 4). This "added trial effect" is not a well established relationship in training with feedback however, and should be viewed as a tentative analysis.

One assumption is implicit in every discussion of feedback: To provide feedback or knowledge of results, a language of some sort exists or is created experimentally to express the required information to the subject. Time on target may be used with tracking tasks and percentage correct is frequently used in the classroom to provide feedback. The experimental literature on human learning contains many forms of feedback which include more or less awkward attempts to generate an effective feedback language that will generate efficient learning.

Techniques for training complex human skills rely on repeated practice trails until some criterion for performance is reached. For example,

teaching of acting, public speaking, salesmanship, and various athletic skills is accomplished by practice accompanied with an ofttimes unsystematic application of verbal coaching. Very little has been done that systematically examines techniques and procedures for training social interaction skills, such as salesmanship, etc. (Berelson and Steiner, ref 5). The psychotherapeutic techniques that are frequently used in clinical settings are role-playing, "T"-groups, and the like. These devices for therapy (except "T" group) have not been studied as training procedures. It is useful to consider these techniques as procedures that attempt to modify complex social interaction behaviors through the presentation of an array of stimuli and cues that are as complete as possible to facilitate recall and retention of appropriate behaviors and sequences of exchanges of behaviors among several people.

Self-confrontation provides feedback to an individual. This feedback is a virtually complete set of the stimuli just experienced by the subject in some situation. The principal change is, obviously, that the subject is now watching the scene unfold instead of participating in it. For training purposes, certain modifications may be added to the phenomenon which aid changes in performance. An objective or set of objectives are required for any training. Verbal coaching may accompany the self-confrontation to provide the subject with immediate comparison of what he is witnessing and the standards or objectives for training. Self-confrontation is suited most readily for use as a training technique in cases where complex skills are involved, since no other technique supplies the same amount and kind of information to the subject to stimulate his recall of past performance. An analysis of the secondary reinforcing properties of self-confrontation requires explicit research which is designed for this purpose. The published papers on the topic of self-confrontation are small in number and generally disappointing in their empirical substance. Nevertheless, enough material is available to suggest particular research endeavors which will provide a basis for the use of this phenomenon as a training technique.

SECTION II

REVIEW OF LITERATURE

A. Self-Confrontation

The most extensive work on self-confrontation has been done by Gehard Nielsen (ref 6, 1962). His interest in the phenomenon stemmed from contact with H. A. Murray and personology. (Nielsen was a graduate student under Murray and performed his research within the theoretical framework of personology which was generated by Murray.) Self-confrontation was used by Nielsen as a purely clinical technique for the analysis of personality structure. His concern was definitely not the modification of observable behavior, although the usefulness of the technique in this regard was demonstrated in a limited sense. Nielsen's procedure utilized the complex behaviors that developed between members of a dyad in stressful debate.

Twenty-two subjects wrote an essay on their personal philosophy and included a summary of four major statements. These essays were written over a period of weeks. Subjects were much involved in these depositions

thus insuring commitment to the points covered. Upon completion of the essay, the Ss were to meet with another individual (who also wrote an essay) to discuss and defend the positions taken in the essay. This other individual was a confederate of the experimenter, however.

On the day before the discussion, the S and the confederate were given each other's essay to read and prepare for the discussion. The same individual served as confederate through the entire experiment. His instructions were to make the subjects withdraw their statements, change or modify their beliefs, or otherwise modify the content of the essay.

The discussion was of 12 minutes duration and was recorded on sound motion picture film. The Ss were aware of being filmed.

Following the discussion and before the confrontation, the subject was interviewed. During the interview, misperceptions of what had happened in the discussion were made by the subject. For example, subjects were often not aware of their inabilities to defend philosophical positions. Also, subjects were not aware of certain gestures and mannerisms that they exhibited in the discussion.

Certain measures were taken during the confrontation sessions. Much of Nielsen's data on the confrontation sessions consists of dialogue and commentary. His book contains no reproduction of interview schedules or observer protocols. However, the topics of concern in Nielsen's analysis were: self-attention and self-evaluation; self-explication of bodily movements; idiosyncratic movements and metaphores; and eye movements (observing behavior recorded on the motion picture film). These measures were largely derived from tape recordings made of Ss' comments during the confrontation sessions. Neilsen simply counted the frequency of comments directed toward self or those made to account for certain expressive gestures.

An individual's awareness of his own behaviors in a situation is usually distorted by self-interest and personal involvement. In the self-confrontation condition, a record of the reality of one's performance contradicts erroneous perceptions and may be painful. That is, a degree of discomfiture is sometimes produced by confrontation with the reality of one's performance. Nielsen discusses at length the nature of "self" or "Me" as a phenomenological entity. He devotes much space to what Rubin and From have labeled "emergent phenomena" (cited by Nielson, ref 6, p28). While Nielsen's concern with self-awareness from the standpoint of phenomnology is of little help in examining self-confrontation as a training technique, the reactions of the Ss during the confrontation sessions are interesting, since Ss are made aware of many subtle contingencies between their behavior and the environment.

> The most important aspect of self-awareness among those listed is that "...the subjects saw themselves on a movie,...which gave them an opportunity to see themselves..., as others might see them or as they see others. Thus, they were able to apply a set of person perception standards to seeing themselves which normally are applied only to others.... The subjects reported this as one of the most interesting aspects of the experiment. (ref 6, p. 35)"

This "seeing oneself from the outside" suggests that subjects can judge their

performance with a given set of standards and will, presumably, modify their behavior to meet these standards when they are again put into the situation in question.

The differentiation between communicative movements and those of individual mannerisms is important in determining the structure of interaction. Nielsen was interested in mannerisms from a clinical point of view. The function of such mannerisms in the interaction process is interesting. Nielsen proposes that ideosyncratic movements stem from some

> "... deeply seated dispositions and they are likely to become manifest in situations in which the totality of the personality is involved... I feel inclined to postulate that... (mannerisms)... are likely to occur at any moment when the person's behavior is blocked or modified for some sudden reason."(ref 6, p. 125)

One measure taken by Nielsen during the discussion before confrontation was the amount of time the subjects spent looking at the other person in the dyad.

> "All subjects looked away for more than 25 percent of the time. Half the subjects looked away for more than half the time.....
> The subjects looked away mostly when they were speaking themselves. Half of the subjects looked away for more than half the time they were speaking to the... (confederate). "(ref 6, p. 157).

This observing behavior was used by the subjects as a strategy in the verbal contest that developed during the discussion. Observing behavior was particularly studied as part of the nonverbal communication process and was used by the subjects in a variety of ways, all clearly specifiable.

> "The general tencency in the visual behavior to follow speaking-listening was discussed in the light of several possible interpretations. It was maintained that each particular visual act may have a number of functions. It may be a matter of observing, orientation, inspection, a rhetorical device, an example of expressive behavior, a concealment response, an avoidance of distraction or a search for pacification. "(ref 6, p. 158).

The degree and kind of looking behavior (observing the other person) would seem to be a rather important part of the interaction process. Therefore, any training program which attempts the modification of interaction skills would necessarily take into consideration observing behavior.

Nielsen's design included a reconfrontation with the films 18 months after the discussions took place. The effect of this event on the subject's perception and evaluation of their performance was striking. While in the early confrontation session, subjects tended to view themselves in an extremely subjective fashion. The delay of a year and half modified this evaluation so that subjects saw themselves in a much different way. The reconfrontation sessions were characterized by subjects taking a very objective hard look at their performance and seeing themselves without the emotional contamination which was representative of certain judgements during the early confrontation. Subject's evaluation of the confederate also changed.

4

"Compared to the... (early)... session, the evaluation of the...
(confederate)... in the late playback had changed. He was now
(late session) seen more as an individual with his own feelings,
thoughts, needs and interests in the dyad than was the case in
the first session in which the subjects tended to see him more
as representing a generality of dispositions, a type, a class of
people. On the other hand, the self-evaluation followed the
opposite trend. Looking back, they saw themselves as re-
presenting a class of people, as age-stage, as being on a certain
level of intellectual development. "(ref 6, p. 167).

Nielsen concludes his book with a general summary statement of the
method as an evaluation device in therapeutic and analytic situations.

Another application of the self-confrontation technique in a clinical
setting has been recently reported (Stoller, ref 7, 1964). Stoller used closed
circuit television and videotape recording in his studies. This videotape
medium has distinct advantages over motion picture film for the use in self-
confrontation. Videotape requires no processing before playback, thus
making the confrontation instantaneous if desired. The range of environmental
stresses which can be tolerated by videotape is much greater than that of
film.

Stoller's procedure was to record on videotape the group therapy
sessions of patients who suffer from chronic mental disturbances. The
patients are then individually shown the recording and are able to see them-
selves as others see them. Stoller reports that there are marked improve-
ments in the physical appearance, verbal behavior, and use of rational
thought by the patients. As a result of the self-confrontation, Stoller has
been able to return 24 chronically disturbed patients to society on a self-
sufficient basis. Only four of these patients have had to return to an
institution for further treatment.

Stoller's application of self-confrontation to the treatment of mental
patients suggests that the technique is quite effective in facilitating the mod-
ification of behavior. Particularly important is that patients began to apply
standards set by their social environment to change their verbal and non-
verbal behavior. This suggests that self-confrontation provides a detailed
comparison of exhibited behavior and relevent standards to the subject.
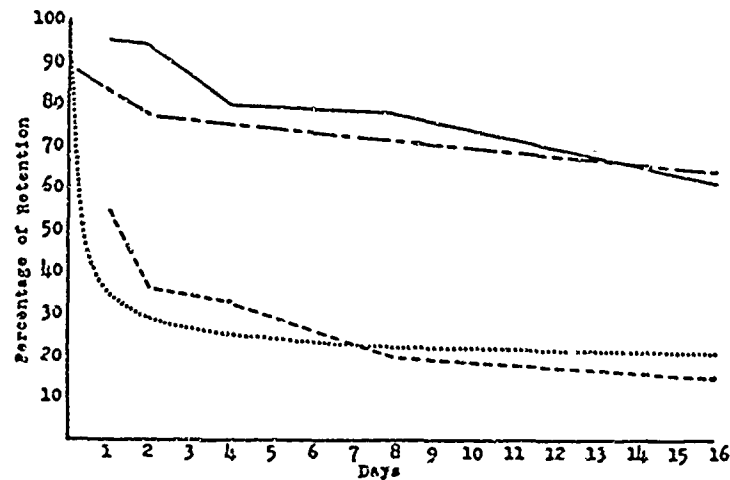
B.   Stimulated Recall

Another technique, similar to self-confrontation has been reported in
the educational research literature (Bloom, refs 8, 9, 10, 11; Bloom and
Broder, ref 12; Gaier, ref 13, 14; Siegel, Siegel, Capretta, Jones and
Berkowitz, ref 15; Siegel and Siegel, ref 15). This technique has been named
stimulated recall. Stimulated recall has been used primarily in the assess-
ment and evaluation of classroom teaching and discussion techniques. The
technique differs from self-confrontation in that stimulated recall presents
a record of performance which is complete only to a point. That is, the
playback of a recording (videotape, film, etc.) proceeds to a "critical"
event in the situation and is stopped. The subjects are then to verbalize
their recollections, evaluations, perceptions, etc., of the remaining sequence.
The playback thus serves to provide cues to events occurring in the original
situation.

5

Bloom's research (ref 8, 9, 10, 11) has used virtually the same method applied to several types of instructional settings. The technique is of primary importance for present purposes and is reported most clearly in the 1950 paper. This study deals with subjects' behavior in group discussion. The effect of stimulated recall on subjects' ability to present accurate re-statements of the concepts and content which were discussed is remarkable. Experimental classes were established wherein part of each class day was devoted to group discussion of a particular topic. The lecture and discussion portions of these classes were sound-recorded (videotape was not available at the time this study was conducted). The lecture and discussion topics were outlined and contained pertinent points of information. The subjects were individually presented with a playback of the recording. This record-ing was stopped just before a "critical" point (i.e., a point immediately preceeding an information source) in the proceedings and the subject was asked to give verbal accounts of his recall of what was to come next.

Measures were developed to assess the relevance of the subjects' reports to the on-going discussion. The results indicate that subjects are stimulated to provide quite accurate and relevant statements. This result is not in the form of a comparison between an experimental and a control group, however. The criteria for relevance and accuracy are provided by the detailed outline of the lecture. The stimulated recall apparently provides a plethora of cues and stimuli which enable a subject to reproduce behaviors with great accuracy.

The emphasis was placed on assessment of educational procedures in Bloom's research. Gaier (ref 13, 14), on the other hand, attempted to inte-grate stimulated recall into the more basic area of interest of retention and memory. The later paper (ref 14) is most explicit in providing a comparison of stimulated recall with the Ebbinghaus retention curve, recognition, and free recall.

Although the technique of stimulated recall uses a more complex and sophisticated subject matter than typical studies of memory functions, the paradigm for investigation of the phenomenon is comparable. Material to be learned is presented, some activity follows, then an occasion is set for the recall of the original material. Gaier analyses the material delivered to students in a lecture, then compared this content to that produced by sub-jects in a stimulated recall condition. Comparisons were made between the amount recalled in the experimental condition and control conditions of free recall and recognition. The retention curves are presented in figure 1.

6

Retention of overt class material as measured under conditions of Stimulated Recall, Gaier (ref 14)

— - — Retention of meaningful material as measured by recognition, Dietze and Jones (ref 17)

-------- Retention of overt class activity as measured by free recall, Gaier (ref 13)

.... Retention of meaningless material as measured by recall, Ebbinghaus (ref 18)

FIGURE 1 RETENTION CURVE UNDER STIMULATED RECALL COMPARED WITH OTHER MEMORY FUNCTIONS*

Although stimulated recall tended to fall below recognition after a period of time, the effect of this technique is striking. Stimulated recall provides sufficient cues to produce extremely high retention for 16 days. The level of difficulty in subject matter may well account for much of the shape of the obtained curves. A replication of this study should be made which includes a comparison controlling for the variable of difficulty.

Siegel and his group (refs 15, 16) have used complete recording and playback in a somewhat different manner. They have established this sort of feedback as a dependent variable measuring system in their attempt to extensively analyse the educational process into coherent clusters of independent variables. The single finding relevent to use of self-confrontation or stimulated recall as a training technique is that videotape or other means of visual and auditory recording provides readily accessible data which may be thoroughly quantified and stored for ready reference.

C. Language Laboratories

Educational research has provided in recent years many new techniques for teaching various subjects and activities. The development of the lan-

*From Gaier (ref 14, p. 149)

guage laboratories is most relevent to a discussion of self-confrontation.
The language laboratory came into being with the advent of low-cost magnetic
tape recording devices. This technical advance allowed the immediate play-
back of sounds and provided an easily storable, permanent record of an
event. The laboratory technique of teaching foreign languages is the most
predominant application of a variety of self-confrontation techniques in a
practical working situation. The method provides a program of instruction
and a model of performance to students so that they may model and compare
their performance to a standard.

One major asset of the language laboratory technique is that it relieves
the instructor from the continuous and time-consuming preparation and
evaluation of teaching activities. Once a program of instruction is put on
tape the students may participate in it at their own speed within the limits
of the course. The instructor is then free to prepare other tapes in the
sequence of instruction while monitoring his students' progress. The time
savings of a laboratory represent a large gain over more traditional teaching
methods. Viewing this laboratory technique as a kind of self-confrontation
suggests that interaction skills may be trained with a smaller administrative
component as well as a smaller number of instructors.

In reviewing the research on language laboratories, Carroll (ref 19)
points out that the available studies on this subject, as is the case with
self-confrontation, are limited in number, scope, and quality. The lack of
control in methodology of basic studies is compensated in some degree by
the uniqueness of the technique in an applied setting. Several studies of the
laboratory teaching techniques have been done (Borglum, ref 20; Borglum
and Mueller, refs 21, 22; Hoge, ref 23; and Mueller and Borglum, ref 24) which
are simply statements of the procedures and activities of established labora-
tories.

One of the better controlled and designed studies (Pickrel, Neidt, and
Gibson, ref 25) compared ordinary classroom practices and language laboratory
procedures in teaching Spanish. Control and experimental Ss were taught
Spanish by two different methods and tested for oral fluency. The instructor
of the control group had taught the language before and was fluent in Spanish.
The experimental group was taught by an instructor who was not fluent in
Spanish. This group used prepared Spanish tapes. There was no significant
difference in the oral fluency of the groups. The investigators conclude that
with the use of prepared tapes, an instructor without special language train-
ing can successfully teach a foreign language.

A study by members of the faculty at Antioch College (Antioch College,
ref 26) investigated the instructor-time saved through the use of a language
laboratory: "It was concluded that for the teaching of 60 students, the ex-
perimental procedures saved about 12 hours per week of the time of regular
instructors without any consequent loss in quality of instruction; the new
method also permitted more supervised learning time for each student."
The instructional procedures used in the laboratory were better liked by
students as well.

These various studies indicate that a confrontation procedure such as
that used in a language laboratory produces the same acquisition of language
skills as usual methods with less time expended in the instructional process.

8

SECTION III

IMPLICATIONS FOR TRAINING

The phenomenon of self-confrontation may be adapted to train individuals in the performance of complex skills required by various social interaction situations. No effective means for accomplishing such training (other than practice) have been in wide use in the past. The techniques generally used to modify interaction behavior take the form common in dramatic coaching; that is, an individually designed training procedure which is specifically adapted to a narrow range of interaction situations. The skills and experience required of the coach or director preclude the general application of this form of training. Proper utilization of self-confrontation as a training technique will reduce the need for special skills or experience in the training supervisor. Presuming that an explicit description of the behavioral requirements exists or can be specified for a given interaction situation, then all that will be required of the personnel involved is a comprehensive working knowledge of those requirements. Since the technique would not require extensive professional competency on the part of the supervisor or instructor, the technique can be made operational over a wide variety of settings and skill levels.

The indications for a training situation seem to be that there exists during confrontation a degree of behavioral "plasticity" which may be utilized in the development of control techniques for unusual behaviors. That is, if performance standards are provided for the subject, then confrontation will provide an environment suitable to their implemention. Self-control of such performance on the part of the subject should ultimately occur. One class of behaviors amenable to such modification and control are those that serve as a sort of nonverbal language; they act as cues and responses in interaction.

Since the confrontation experience provides a period of "plasticity" in a subject, this event could well provide a means for controlling the occurrence of undesired mannerisms. As an example, since in certain cultures contact of the left hand with the mouth is highly disapproved, it may be necessary to reduce the probability of occurrence of this mannerism to an acceptably low level for personnel being trained to serve as advisors in that culture. Therefore if what may be considered a neutral mannerism in one environment is quite meaningful in another, care should be exercised in establishing this contingency as a controlling factor in the subjects repertoire.

The nature of self-confrontation indicates that an examination should be conducted of the types of behaviors which may be effectively trained through its use. The review of the literature has shown that the technique lends itself particularly to skills and behaviors which are complex, involve both verbal and nonverbal components, are occasioned by subtle discriminative stimuli, and occur in sequenced chains. These kinds of behaviors are found in athletic activities. Newspapers have reported that football and basketball coaches are exploring the use of closed-circuit television and self-confrontation for training their teams. Certain tasks which will be required of astronauts fit the stated requirements and the feasibility of using self-confrontation as a training device should be explored in this area. Since missions in space occur in a zero-gravity environment, the performance of the most ordinary

9

tasks to be performed while free-floating will require extensive training and sensitization to the new array of stimuli. Dependence of bodily coordination on visual stimuli is extremely important in this totally new environment. Self-confrontation should prove valuable in training operators in such an environment. In addition to these examples of training individuals, there exist a large number of potentially trainable skills which involve two or more individuals.

The importance in delay of confrontation appears to be that if modification and control of behavior is an objective then the earlier the confrontation the better. This is suggested by the exploratory study of Nielsen and the more objective results in the language laboratory. If specified standards for behavior can be determined for a given situation and at the same time be used as reinforcers, then the Ss' more involved subjective posture towards their behavior may aid in establishing such modification and control. Training techniques for interaction skills under conditions of stress or unusual stimulation require a close approximation of the controlling variables to be experienced in practice. Self-confrontation offers a situation that can make effective use of such stressful or unusual events when confrontation occurs during the time that the Ss are susceptible; i.e., immediately after performance.

One principal area of interest in training research is with the problem of training American personnel to successfully interact with personnel in other cultures. The cultural determinants of the interaction process constitute a set of variables which are quite relevant to the control of interpersonal relationships. The interaction process is generally based on the exchange between two or more individuals of a complex chain of subtle cues. Culturally generated discriminative stimuli for interaction sequences typically have a protracted history of reinforecment for each individual and are therefore widely internalized in the members of a given cultural enclave. Therefore, the specification of the functional relationships which exist in such a setting is difficult. The application of self-confrontation, to such problems will aid the delineation of the parameters involved.

10

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DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
Aerospace Medical Research Laboratories, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio	UNCLASSIFIED
	2b. GROUP
	N/A

3. REPORT TITLE

SELF-CONFRONTATION FOR COMPLEX SKILL TRAINING
Review and Analysis

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Final report, April 1964 - December 1964

5. AUTHOR(S) (Last name, first name, initial)

Eachus, Herbert T., First Lieutenant, USAF

6. REPORT DATE	7a. TOTAL NO OF PAGES	7b. NO. OF REFS
September 1965	12	26

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO 1710	AMRL-TR-65-118
c. Task No. 171008	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	

10. AVAILABILITY/LIMITATION NOTICES

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	Aerospace Medical Research Laboratories, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson AFB, Ohio

13. ABSTRACT

A review of the literature on self-confrontation and related phenomena was conducted to investigate the feasibility of their use as training techniques. The phenomenon of self-confrontation is the feedback of an individual's performance in a given situation through the use of videotape or sound motion picture film. This technique provides complete feedback of information and generates a situation in which subjects are quite amenable to modifications of their behavior, both verbal and nonverbal, with respect to given standards. The body of technical literature dealing with self-confrontation is small but complete enough to provide a basis for discussion of the phenomenon as a training technique. The analysis of the literature resulted in the recommendation for a research program to explore self-confrontation as a training technique for complex human skills.

DD FORM 1473
1 JAN 64

AF-WF-B-AUG 64   400

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Training and training aids						
Psychological stress						
Feedback, human learning						
Complex human skills						
Stimulated recall						
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Literature review						

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